HYPERLIPIDEMIA: ENHANCING PATIENT EDUCATION AND CLINICAL SUPPORT TO IMPROVE SELF-EFFICACY

A Scholarly Project

Submitted to the

Faculty of Liberty University

In partial fulfillment of

The requirements for the degree

Of Doctor of Nursing Practice

By

Kelly Lynn Caniglia

Liberty University

Lynchburg, VA

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Scholarly Project Chair Approval:

Debra Maddox, DNP, CNS-C, FNP-C Date

ABSTRACT

Hyperlipidemia is a chronic, progressive disorder routinely encountered in primary care practice. In the United States, coronary artery disease and cerebrovascular disease are the leading causes of death. Hyperlipidemia is a modifiable risk factor for the development of coronary artery disease, cerebrovascular disease, and peripheral artery disease. However, many individuals fail to recognize the severity of the health consequences associated with hyperlipidemia. Most often, hyperlipidemia is the direct result of unhealthy lifestyle behaviors. Comprehensive care falls short in primary care settings, often due to non-compliance with necessary lifestyle behavior changes. Primary care patients' lack of knowledge and awareness signals a critical need to improve patient education and self-efficacy. The purpose of this Doctor of Nursing Practice (DNP) Scholarly Project was to assess the impact of individualized patient education on self-efficacy, which impacts one's ability to embrace sustainable lifestyle behavior changes. The level of adherence to lifestyle modifications, particularly diet, has a direct impact on lipoprotein levels. Individualized patient education based on individual atherosclerotic cardiovascular disease (ASCVD) risk scores combined with enhanced clinical support improved the level of self-efficacy, thereby increasing the ability of patients to embrace sustainable lifestyle behavior changes.

Keywords: Hyperlipidemia, cholesterol, patient education, lifestyle modifications, self-efficacy, coronary artery disease, atherosclerotic cardiovascular disease (ASCVD) risk

Dedication

God has blessed me in so many ways, but the biggest of them all is my family. I would not have made it without their unwavering support, understanding, and motivation. To my husband, David, and my daughter, Ariana, thank you for being my biggest cheerleaders and pushing me to be the best version of myself. In loving memory of the best father a daughter could ever ask for, Jerome C. Moody, thank you for instilling a thirst for knowledge by empowering me to achieve what I never imagined was possible. I will continue to make you all proud.

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I want to praise God for blessing me with the opportunities that have led me to this moment. I am living proof that a mustard seed of faith can move mountains. God has also blessed me with the right people in my life at the right time. To all who have encouraged me along the way, I am forever grateful for your support. To my amazing “DNP Sistas”, you have been instrumental in my journey, and I am eternally grateful for each one of you. To my chair, Dr. Maddox, thank you for seeing my potential even when I failed to acknowledge it myself. I would also like to thank Amy Beyer and Jessica DiGiorgio for their trust, support, and faith in me.

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List of Abbreviations

The American College of Cardiology (ACC)

The American Heart Association (AHA)

Atherosclerotic cardiovascular disease (ASCVD)

Centers for Disease Control and Prevention (CDC)

Doctor of Nursing Practice (DNP)

Electronic medical record (EMR)

High-density lipoproteins (HDL).

Institutional Review Board (IRB)

Low-density lipoprotein (LDL)

PICO (Patient/Problem/Population; Intervention; Comparison; Outcome) Template

Total cholesterol (TC)

Triglycerides (TG)

U.S. Preventive Services Task Force (USPSTF)

Section One: Introduction

Hyperlipidemia, or abnormally elevated levels of serum cholesterol, is among the most common chronic conditions diagnosed and treated in primary care. In the United States, an estimated 86 million adults have been diagnosed with hyperlipidemia (Li et al., 2022). The prevalence of hyperlipidemia can vary significantly based on sex, age, race, and socioeconomic status (Li et al., 2022). In the United States, the incidence of hyperlipidemia has been intensified by an ongoing obesity epidemic (Agarwala et al., 2022). Approximately 60–70% of obese individuals and 50–60% of overweight individuals have been diagnosed with hyperlipidemia (Agarwala et al., 2022). The Commonwealth of Virginia is among the states with the highest prevalence and incidence of hyperlipidemia (Centers for Disease Control and Prevention (CDC), 2023). Hyperlipidemia does not exhibit any clinical symptoms; however, the underlying pathophysiology places patients at a substantially increased risk of life-threatening cardiovascular diseases. Unawareness of the clinical significance of atherosclerotic vascular disease associated with hyperlipidemia is a clinical problem within the primary care setting. Left untreated, hyperlipidemia results in severe cardiovascular disease, including sudden death (CDC, 2023). Comprehensive care falls short in the primary care setting, often due to non-compliance with necessary lifestyle behavior changes. In the United States, one-third of all deaths are attributed to heart disease and stroke, costing an estimated $216 billion per year (Blinnikova et al., 2024). Hyperlipidemia is believed to be the underlying cause of 2% of all disability-adjusted life years and 4.5% of total deaths (Abbasi et al., 2024).

Background

The main functional plasma lipoproteins are total cholesterol (TC), triglyceride (TG), low-density lipoprotein (LDL), and high-density lipoprotein (HDL). TC is primarily produced in

the liver, with a small percentage derived from the diet. TC aids in the synthesis of cell membranes and the production of vitamin D, steroid hormones, and bile acids (Berberich & Hegele, 2022). TG transports fat in the bloodstream and produces energy for muscle and adipose tissue (Berberich & Hegele, 2022). TG is primarily derived from the diet, with a small percentage produced in the liver. LDL, also known as the "bad cholesterol," transports TC and TG from the liver to peripheral tissues (Das & Ingole, 2023). HDL, also known as "good cholesterol," binds to excess cholesterol in the bloodstream and transports it back to the liver to be excreted in bile (Das & Ingole, 2023). HDL is primarily produced in the liver and intestines.

Pathophysiology

High levels of LDL cause excess TC and TG to form fatty deposits, which accumulate as plaque on the walls of blood vessels. The associated plaque buildup then causes the lumen of blood vessels to narrow, a process referred to as atherosclerosis. Atherosclerosis remarkably increases the risk for carotid artery disease, coronary artery disease, cerebrovascular disease, and peripheral artery disease (Das & Ingole, 2023). Atherosclerotic blood vessels are also thinner, increasing the risk of spontaneous rupture. Unlike the other lipoproteins, an elevated HDL level is believed to offer protection against atherosclerosis. A low HDL level is believed to be a risk factor for the development of atherosclerosis. However, recent research shows this relationship is less influential than was initially believed (Berberich & Hegele, 2022). Research has also generated awareness of apolipoproteins, which cause LDL particles to become "stickier" and accumulate more readily within blood vessel walls (Das & Ingole, 2023).

Screening and ASCVD Risk Estimation

It has been well-established that elevated levels of LDL (greater than 160 mg/dl), TC (greater than 240 mg/dl), and TG (greater than 200 mg/dl) are modifiable risk factors for the

development of atherosclerotic cardiovascular disease (ASCVD) (Li et al., 2022). The analysis of lipoprotein levels via serum sampling is recommended for adults aged 20 years of age and older (Ballard-Hernandez & Sall, 2023). The American College of Cardiology and the American Heart Association's (ACC/AHA) (2018) guidelines do not call for a fasting lipid profile, but research indicates that a fasting lipid profile to evaluate LDL cholesterol levels is preferential (Zaid et al., 2024). In high-risk individuals, the laboratory analysis of lipoproteins should also include measurement of apolipoproteins.

The primary prevention of ASCVD events is based on the overall ASCVD risk for each patient (AHA, 2018). Healthcare providers can utilize a risk estimator tool developed by the ACC/AHA to assess the 10-year risk of ASCVD in individual patients (Appendix I). The tool is based on pooled cohort equations to aid in the identification of patients at high risk for ASCVD events (Lloyd-Jones et al., 2018). It is important to note that the ASCVD risk assessment does not consider risk-enhancing factors such as socio-economic status, family history, chronic inflammatory disease, kidney disease, and metabolic disease (Lloyd-Jones et al., 2018). Individuals with an ASCVD risk score of <5% are categorized as having a low risk; those with a risk score between 5-7.5% are at borderline risk; those with a risk score between 7.5-20% are at intermediate risk; and those with a risk score >20% are at high risk. ASCVD risk reduction is dependent upon patient knowledge, self-efficacy, and compliance with prescribed treatment.

Treatment Guidelines

Hyperlipidemia has two key causative factors: it is caused by either genetics or unhealthy lifestyle habits. Apolipoprotein levels are impacted primarily by genetic factors, not diet. In younger patients, it is often related to a combination of these two factors. Lifestyle modifications have been shown to improve health outcomes, enhance patient well-being, and reduce associated

healthcare costs (Blinnikova et al., 2024). Lifestyle modifications including physical activity, healthy diet, smoking cessation, and alcohol avoidance, are the evidence-based first-line treatments for the clinical management of hyperlipidemia. Effective and sustainable lifestyle modifications are dependent upon sustained engagement in self-care behaviors, which in turn are dependent upon personal levels of self-efficacy (Blinnikova et al., 2024). Low levels of self-efficacy have been associated with decreased patient compliance with lifestyle modifications, which contributes directly to poor health outcomes (Blinnikova et al., 2024). Enhanced clinical support from healthcare providers also has the potential to improve levels of self-efficacy through positive behavioral reinforcement.

Diet quality has a direct impact on hyperlipidemia, with more than half of all cardiovascular deaths being the direct result of unhealthy dietary behaviors (Blinnikova et al., 2024). Updated evidence-based cholesterol guidelines favor dietary patterns that promote the consumption of produce, whole grains, and minimally processed foods (Blinnikova et al., 2024). For example, there is substantial evidence supporting the health benefits of the Mediterranean diet, particularly among individuals with cardiovascular disease (Campbell et al., 2019). Elevated LDL levels have a direct correlation with the development of atherosclerosis. Limiting dietary consumption of saturated fats, trans fats, and cholesterol has been shown to decrease overall LDL levels by 5-10% (Agarwala et al., 2022). The amount of dietary carbohydrates consumed has been shown to directly influence TG levels (Agarwala et al., 2022). Guidelines also recommend patients strictly monitor the consumption of simple carbohydrates, sugars, refined grains, and alcohol (Agarwala et al., 2022). Increasing dietary consumption of foods containing omega-3 fatty acids aids in increasing serum HDL levels (Das & Ingole, 2023). Previous guidelines emphasized educating patients to increase HDL levels, as it was initially

believed low HDL levels contributed to excess serum TC (Berberich & Hegele, 2022). Reducing or abstaining from alcohol consumption has been shown to decrease TG levels by an estimated 10% (Agarwala et al., 2022). One ounce of alcohol consumption has been shown to raise TG levels by 5–10% (Agarwala et al., 2022). Weight loss (5-10% of body weight) is strongly encouraged for those who are overweight, which has been associated with an estimated 20% decrease in TG levels and a 3-5% decrease in LDL levels (Agarwala et al., 2022). Current guidelines also recommend moderate-intensity physical activity (at least 150 minutes per week) or vigorous-intensity physical activity (at least 75 minutes per week; Arnett et al., 2019). Increased physical activity has been associated with an estimated 30% decrease in TG levels and a 3-6% decrease in LDL (Agarwala et al., 2022). The current guidelines also recommend that patients who use tobacco products quit (Arnett et al., 2019). Aspirin has been proven to be ineffective in ASCVD risk reduction (Arnett et al., 2019). Patients with hyperlipidemia should maintain a blood pressure of less than 130/80 (Arnett et al., 2023).

There is a clear and proven benefit to statin therapy for most hyperlipidemia patients, yet slightly more than half of eligible patients are currently taking a prescribed statin medication (Bordoni & Hill, 2023). Statin therapy is recommended as a first-line treatment in patients found to have an increased ASCVD risk (Arnett et al., 2023). Initiation of moderate- to high-intensity statin therapy is recommended for individuals with an estimated ASCVD risk of 7.5% or higher (Lloyd-Jones et al., 2018). However, research shows that many patients opt for lifestyle modifications over statin therapy.

Problem Statement

The effectiveness of increasing levels of self-efficacy to aid in initiating and maintaining lifestyle behavior changes has been well-established. Lifestyle modifications have been

identified as first-line treatment in ASCVD risk reduction (Kang et al., 2021). The challenge for many patients remains the capability to sustain the necessary behavior changes (Ballard-Hernandez & Sall, 2023). Providing education and enhanced clinical support for the necessary behavior changes should be a top priority among primary care providers. The most significant factors impacting sustainability are the awareness of associated ASCVD risk, self-efficacy, and a strong aversion to pharmacotherapy (Rodriguez et al., 2022). Despite the widespread availability and recent advancements in lipid-lowering pharmacologic agents, ASCVD remains the leading cause of death worldwide (Di Fusco et al., 2023). Healthcare providers must ensure all patients understand the potential health risks, treatment options, current evidence-based guidelines, and associated risks of noncompliance (Bordoni & Hill, 2023).

Purpose of the Project

The purpose of this evidence-based quality improvement project was to provide patient education and enhanced clinical support to increase self-efficacy. Research highlights the critical role primary care providers play in promoting self-efficacy. Low engagement and noncompliance with evidence-based guidelines significantly increase ASCVD risk and associated health consequences (Rodriguez et al., 2022). Individuals must be encouraged to mitigate the cumulative health risks of hyperlipidemia by taking an active role in their health and well-being through the adaptation of a healthy lifestyle. Increasing patient adherence to evidence-based dietary guidelines by 20% has the potential to save 31.5 billion in annual healthcare costs (Rodriguez et al., 2022).

Clinical Question

In adult patients diagnosed with hyperlipidemia, does individualized patient education based on ASCVD risk and enhanced clinical support improve self-efficacy related to the medical

management of hyperlipidemia over 12 weeks compared to the current practice of non-individualized patient education and limited clinical support?

Section Two: Literature Review

To enhance self-efficacy related to lifestyle modifications, one must first have an understanding of what that entails. An in-depth literature review was conducted to gather, analyze, critique, and summarize available research (Appendix A). The available literature was then utilized to define the scope of the clinical problem and identify evidence-based solutions. Hyperlipidemia is the most common modifiable cause of atherosclerosis. Coronary artery disease, microvascular disease, cerebrovascular disease, and peripheral arterial disease are all directly related to atherosclerosis. Given the high incidence of these disease processes in the United States, ASCVD risk reduction should be a top priority for primary care providers. A comprehensive, patient-centered approach to increasing self-efficacy and awareness of lifestyle modifications is critical for effective ASCVD risk reduction. The literature review was also utilized to establish supporting evidence for the quality improvement scholarly project. Ongoing advancements in treatment guidelines necessitate enhanced patient education, particularly given the strong aversion to statin therapy among primary care patients who are treated at the clinic. Promoting self-efficacy is among the most efficient approaches to encouraging healthy lifestyle behaviors.

Search Strategy

PubMed Central, PubMed Medical Subject Headings (MeSH), MedGen, CrossRef, Ovid MEDLINE, Cochrane Library, ProQuest Central, and the Cumulative Index of Nursing and Allied Health Literature (CINAHL) databases were all accessed through the Jerry Falwell Library at Liberty University. Search keywords included “hyperlipidemia,” “updated

hyperlipidemia treatment guidelines," "self-efficacy," "clinical support of patients with hyperlipidemia," "ASCVD risk assessment," and "hyperlipidemia patient education". Related topic searches were also conducted when potentially relevant research was discovered. Applied filters were "full text online," "peer-reviewed," "open access," "journal article," "magazine article," "any type of discipline," and "five years". Inclusion criteria included full-text articles, articles written in English, a high level of evidence, studies among adult patients, and studies within the United States. Exclusion criteria included articles not written in English, studies among pediatric patients, and a low level of evidence. Professional guidelines, randomized controlled trials, cohort studies, observational studies, systematic reviews, and meta-analyses were evaluated for their content related to the following topic areas: hyperlipidemia pathophysiology, hyperlipidemia treatment guidelines, ASCVD risk assessment, self-efficacy, lifestyle modifications (e.g., diet, exercise/physical activity, obesity, weight loss, hypertension, tobacco use, and alcohol use), pharmacotherapy, and alternative treatments. Evidence-based recommendations from the U.S. Preventive Services Task Force (USPSTF) were also evaluated.

Critical Appraisal

The Melnyk Framework, a pyramid-shaped model, was utilized to assess the hierarchy and validity of evidence based on their placement within the pyramid (University of Michigan Library, 2024). The research study designs analyzed during the literature review, in order of strength, were meta-analyses, systematic reviews, randomized controlled trials, cohort studies, case-control studies, and case series/case reports. The collected research was prioritized for inclusion based on the strength of the research study design, which also ensured the validity of the research. Research articles with the highest level of evidence provided the strongest supporting evidence for the clinical question (University of Michigan Library, 2024). Meta-

analyses and systematic reviews, the highest levels of evidence, were analyzed for background information and utilized to provide supporting evidence for the scholarly project. Professional guidelines were utilized to identify evidence-based recommendations for patient education. Randomized control trials provided support for the cause and effect of hyperlipidemia and lifestyle modifications. Observational and cohort studies provided awareness of existing knowledge gaps that influence awareness and adherence to evidence-based treatment recommendations. Studies that failed to establish a causal relationship between hyperlipidemia and lifestyle modifications were excluded. Cross-sectional studies were excluded, as they merely provided an observation of the phenomenon. The lowest level of evidence, expert opinion, was selected for inclusion because it provided background information.

Synthesis

Hyperlipidemia, often referred to as the silent killer, leads to the buildup of plaque formations within the walls of blood vessels, significantly raising the risk for ASCVD. Due to the lack of clinical symptoms, patients are often unaware of the risk and severity of the health complications associated with hyperlipidemia. Hyperlipidemia has been identified as a major modifiable risk factor for ASCVD, which is the leading cause of death in the United States. Genetics, excessive alcohol consumption, obesity, and a diet high in carbohydrates, fats, and sugars have been proven to contribute to the development of hyperlipidemia. A causal association has been established between elevated LDL and TG levels and ASCVD.

Evidence-Based Treatment Recommendations

Due to the increasing complexity of treatment options, clinical practice guidelines recommend a patient-centered approach in the management of hyperlipidemia (Appendix J). Available research does not provide a recommendation for targeted LDL or TG levels. Instead,

the assessment of ASCVD risk and lifestyle modifications are recommended. Adults between the ages of 40 to 75 years of age should undergo a 10-year ASCVD risk estimation (Appendix I). The patient's 10-year ASCVD risk should be utilized as a guide for treatment recommendations. Socioeconomic status plays a significant role in ASCVD risk, with a heightened risk linked to lower socioeconomic status. Sociodemographic factors that impact ASCVD risk include age, sex, and race/ethnicity. The ASCVD risk assessment can also aid in patient education by illustrating the individualized risk of ASCVD. An extensive literature review revealed that ASCVD risk reduction is focused on the management of self-efficacy.

Lifestyle modifications are recommended as first-line treatment unless a patient has a heightened ASCVD risk (Reiter-Brennan et al., 2020). Multiple observational studies have highlighted the benefits of lifestyle modifications in addressing modifiable risk factors (Reiter-Brennan et al., 2020; Shin et al., 2020). Plant-based diets low in saturated and trans fats are associated with a statistically significant lower ASCVD risk (Shin et al., 2020). A Southern dietary pattern, such as that found within Virginia, significantly increases cardiovascular and cerebrovascular disease risk. Most of the United States population fails to meet minimum physical activity recommendations to reduce ASCVD risk.

For patients with an elevated ASCVD risk score, the U.S. Preventive Services Task Force (USPSTF) recommends statins as primary therapy for adults aged 40 to 75 (Reiter-Brennan et al., 2020). However, statin therapy has known side effects that contribute directly to patient noncompliance. Many lipid-lowering drugs have been developed since the release of the 2018 ACC/AHA guidelines. A lack of understanding of pharmacologic options among patients and healthcare providers has been identified as the primary factor contributing to hesitancy to initiate pharmacotherapy. Statins, ezetimibe, PCSK9 monoclonal antibodies, bile acid sequestrants, and

HMG-CoA reductase inhibitors have all been proven highly effective in impacting patient outcomes. One observational study revealed that approximately 55% of eligible patients were not receiving any type of pharmacotherapy.

Conceptual Framework

The Iowa Model of Evidence-Based Practice (IM) was utilized to integrate evidence-based recommendations into clinical practice (Appendix E). Approval to use the IM to guide the development, implementation, and evaluation of the scholarly project was sought and granted (Appendix D). The IM recommends the researcher first gather credible, high-quality research evidence to inform a change in practice. Once the clinical problem was identified, a synthesis of available research evidence was executed, and the evidence was critically appraised (Appendix A). The next steps were to educate and engage shareholders to obtain buy-in and review baseline data. Once the topic was declared a priority by the researcher, project chair, and key stakeholder, the next step was the development of the clinical question, utilizing the PICO (Patient/Problem/Population; Intervention; Comparison; Outcome) template: In adult patients diagnosed with hyperlipidemia, does individualized patient education based on ASCVD risk improve self-efficacy related to the medical management of hyperlipidemia over 12 weeks compared to the current practice of non-individualized patient education? The IM was then utilized to guide the selection, critique, appraisal, and synthesis of available research evidence (Melnyk & Fineout-Overholt, 2019). It was then determined that there was enough high-quality evidence to support a change in current practices. An appropriate intervention based on evidence-based recommendations was then developed and key stakeholders were educated on the evidence-based scholarly project to garner support (Appendix C). The next step was the implementation of the scholarly project. The resultant data were carefully analyzed at the end of

the 12 weeks to determine if the project intervention warranted full integration and sustainment. Dissemination of the resultant findings were then utilized to generate knowledge, improve practice standards, and enhance patient outcomes.

Theoretical Framework

Albert Bandura's "Self-efficacy: Toward a Unifying Theory of Behavioral Change" provides the conceptual context for understanding patient behavior. According to Bandura (1977), "…expectations of personal efficacy determine whether coping behavior will be initiated, how much effort will be expended, and how long it will be sustained in the face of obstacles and aversive experiences" (p.191). In essence, self-efficacy is based on one's confidence in the ability to achieve and sustain the behaviors necessary to generate anticipated outcomes (Bandura, 1977). In this case, a high level of self-efficacy is essential for sustainable changes in lifestyle behaviors. An individual's level of self-efficacy is impacted by prior experiences, social role models, feedback, and emotional, physical, and psychological well-being (Bandura, 1977).

Modifiable risk factors for the development of hyperlipidemia are correlated with unhealthy lifestyle behaviors, such as a diet high in trans and/or saturated fatty acids, smoking, a sedentary lifestyle, and obesity (Abbasi et al., 2024). Bandura's theoretical framework (1977) relates to the scholarly project because human behavior plays a substantial role in the sustainability of healthy lifestyle behaviors, which is the first-line recommended treatment in the clinical management of hyperlipidemia. One's beliefs about their abilities to produce the necessary lifestyle changes have a profound effect on those abilities (Bandura, 1977). Raising awareness of personal ASCVD risk, as well as the impact of lifestyle behaviors, can aid with increasing levels of self-efficacy by enhancing personal motivation and engagement.

Summary

A correlation between the prevalence of hyperlipidemia and the incidence rate of cardiovascular events has been firmly established. Addressing knowledge gaps can improve adherence to treatment recommendations, increase self-efficacy, increase the value of shared decision-making, and reduce the prevalence of serious ASCVD events. Evidence-based guidelines highlight the critical role nutrition, physical activity, maintaining a healthy weight, reducing blood pressure, avoiding alcohol consumption, and limiting tobacco exposure plays in lowering lipid levels and ASCVD risk reduction (Ballard-Hernandez & Sall, 2023). Sustainable changes to unhealthy lifestyle habits can be challenging for patients, as there are a multitude of barriers that can impact lifestyle modifications. Enhancing self-efficacy is imperative to creating meaningful and sustainable healthy lifestyle behaviors. When lifestyle modifications fail to lower lipoprotein levels, statins remain the recommended first-line pharmacologic treatment. Statins are also recommended for primary prevention in adults aged 40 to 75 years of age who have one or more ASCVD risk factors and an estimated 10-year ASCVD risk of >10% (USPSTF, 2022). Treatment regimens for statins are low-intensity, moderate-intensity, and high-intensity (Grundy et al., 2018). However, available evidence indicates that for most individuals, moderate-intensity statin therapy is most effective in the primary prevention of ASCVD (USPSTF, 2022). The decision to initiate pharmacotherapy should be based on individual patient preference and education of risk versus benefit.

Section Three: Methodology

"This project was undertaken as a Quality Improvement/Evidence-Based Practice Initiative at the practicum/project site, and as such was not formally supervised by the Liberty University Institutional Review Board."

This quality improvement project was undertaken at a rural healthcare clinic in central Virginia. The clinic strives to promote shared decision-making and individualized treatment recommendations. This patient-centered theology provided the foundation for the scholarly project. Evidence-based recommendations and conceptual and theoretical frameworks were utilized to guide the project design, develop the intervention, identify measurable outcomes, guide data collection, evaluate project outcomes, and disseminate the findings. The target population was chosen randomly based on inclusion criteria, as previously discussed. Ethical considerations were identified and addressed before the implementation of the scholarly project intervention.

Project Design

The IM was utilized to guide the development, implementation, and evaluation of the evidence-based quality improvement project. To identify the target population, a retrospective chart review of the electronic medical record (EMR) was conducted. The feasibility study consisted of a quantitative, comparative, quasi-experimental design to evaluate the impact of individualized patient education on levels of self-efficacy.

Measurable Outcomes

It was speculated the intervention would increase self-efficacy and knowledge base, accompanied by a reduction in ASCVD risk. A baseline fasting lipid panel was located within the EMR and evaluated at the time of implementation. The goal was for a repeat fasting lipid panel towards the end of the 12-week intervention to assess the impact of enhanced education and clinical support on lifestyle behaviors. The level of adherence to lifestyle modifications, particularly diet, has a direct impact on lipoprotein levels.

Project Setting

The scholarly project was completed at a rural healthcare clinic in central Virginia, which provides primary care, urgent care, laboratory services, telehealth services, and drug screenings to patients across the lifespan. During clinical rotations, it was noted that there was a significant population of patients with either elevated lipoprotein levels or a clinical diagnosis of hyperlipidemia. A hesitancy among this patient population to initiate pharmacotherapy was also observed. Patients opted for lifestyle modifications, but there was a notable lack of knowledge, awareness, and self-efficacy to optimally self-manage this disease process. Authorization for the scholarly project was provided by the clinic's owner, a nurse practitioner with autonomous practice privileges (Appendix C). Key stakeholders included the community, primary care patients, two healthcare providers, the scholarly project chair, and the project leader (the DNP student).

Target Population

The project leader utilized convenience sampling to identify a target population of 25 potential participants. The eligible participants were chosen at random based on the inclusion criteria and were asked to participate in the intervention (Appendix G). Twenty of the eligible participants were contacted by the project leader via email to obtain consent for participation (Appendix H). Five eligible participants were educated in the clinic by key stakeholders. Inclusion criteria included adults between the ages of 40 and 79 years old, a clinical diagnosis of hyperlipidemia and/or elevated serum lipoprotein levels (within the previous three months), primary care patient of the clinic, and reliable internet connection with access to email. Exclusion criteria included those without a clinical diagnosis of hyperlipidemia, elevated serum lipoprotein levels greater than the previous three months, unreliable internet access, and limited

email access. The quality improvement project was not exclusive to those with a limited understanding of hyperlipidemia. No preference was given to socioeconomic status, in order to positively influence participation.

Ethical Considerations

Project participants voluntarily consented to participate in the feasibility study. The potential risks and benefits were reviewed with each participant and a consent form was provided. The ethical principles of beneficence (doing good for patients), autonomy (the patients' right to make decisions), nonmaleficence (do no harm), and justice (fair distribution of resources) guided the scholarly project (Melnyk & Fineout-Overholt, 2019). An application was submitted to the Institutional Review Board (IRB) at Liberty University to ensure ethical compliance with these principles (Appendix F). Additionally, the project leader and project chair completed research ethics training to ensure the protection of the rights of human subjects throughout the research process (Appendix B). All data remained private and confidential. Potentially identifying information was requested as part of this study, but participant identities were not disclosed within the final report. Participant information was kept confidential by replacing names with numbers. Research records were stored securely. Electronic data were stored on a password-protected computer. Physical data were stored in a locked file cabinet. The researcher and members of the doctoral committee had access to all collected data. Three years after the completion of this study, all electronic records will be deleted, and all physical records will be shredded.

Data Collection

Demographic information was obtained directly from participants in combination with a retrospective review of the EMR. The pre- and post-questionnaires consisted of subjective

questions, multiple-choice, true/false questions, fill-in-the-blank questions, and a 4-point Likert scale (Appendix K). The ASCVD risk calculator was performed, and participants were provided with a personal ASCVD risk score. Fasting lipid panels were reviewed at the start of the project. A repeat laboratory analysis was planned towards the end of the 12-week intervention.

Tools

Both face-to-face education and email were utilized to recruit potential participants (Appendix G). Pre and post questionnaires were created utilizing Survey Monkey. The associated links were emailed to the project participants to complete. Each questionnaire consisted of subjective questions, multiple choice, true/false questions, fill-in-the-blank, and a 4-point Likert scale (Appendix K). A brief outline of education topics, as well as a weekly schedule, were also emailed to participants (Appendix L). The ASCVD Risk Algorithm Calculator was utilized to calculate the 10-year risk of ASCVD events, which is the evidence-based cornerstone of the prevention and clinical management of hyperlipidemia (Appendix I).

Project Intervention

Once eligible participants were identified by either the project leader or key stakeholders, education was provided on the scholarly project to obtain consent for participation. Participants were then given a demographic form to fill out, which was then utilized to estimate personal ASCVD risk. The personal ASCVD risk score was utilized to engage patients actively in shared decision-making. Analysis of lipoprotein levels was done at the time of implementation, with a plan to be repeated at week 8. Based on evidence-based guidelines, hyperlipidemia was defined as LDL levels greater than 160 mg/dl, TC greater than 240 mg/dl, and/or TG greater than 200 mg/dl. A questionnaire was provided during week one and another during week 12 to compare self-efficacy, knowledge base, and awareness of necessary lifestyle modifications. The education

portion consisted of 10 PowerPoint modules, which required 10-15 minutes to complete. The aim was to optimize levels of self-efficacy, which in turn, would increase the sustainability of lifestyle modifications. The modules were provided during weeks 2-11 and each module focused on a different evidence-based topic (Appendix L). Awareness of personal ASCVD risk, dietary improvements, increased physical activity, avoidance of tobacco products, and alcohol abstinence were identified as the most beneficial lifestyle modifications. Each weekly email also served as a check-in, providing participants with positive reinforcement and enhanced clinical support. 12 weeks was identified by the project leader as ample time to improve self-efficacy, knowledge base, and awareness.

Scholarly Project Timeline

The Scholarly Project Timeline was developed to identify, track, and estimate completion dates of key milestones throughout the quality improvement process. The scholarly project process was completed sooner than was projected. The data collection and analysis were completed before the estimated completion date. The editing process was also significantly faster than anticipated, resulting in an earlier defense date.

Table 1

Scholarly Project Timeline

Action item	Anticipated completion date
Permission to use the Iowa Model of Evidence-Based Practice to Promote Quality Care	January 21, 2024
Identify area for quality improvement/develop a plan	February 11, 2024
Obtain permission from the project site	February 19, 2024

Complete CITI Training	February 20, 2024
Scholarly proposal defense with chair	April 12, 2024
Obtain IRB approval	April 19, 2024
Educate clinic staff/identify the target population	April 26, 2024
Recruit participants/educate/obtain informed consent	May 3, 2024
Implement intervention	May 6, 2024
Provide weekly patient education and enhanced clinical support	May 6-July 22, 2024
Data analyses/dissemination of results/evaluation of outcomes	July 29, 2024
Send the final copy of the paper to the editor	July 30, 2024
Complete scholarly project PowerPoint	August 5, 2024
Obtain approval from the project chair/schedule defense	August 13, 2024
Scholarly project defense	August 19, 2024
Submit to Scholar's Crossing for publication	August 26, 2024

Feasibility Analysis

The site of the scholarly project incurred no extra expenditure. The project work was completed by the project leader as part of the doctoral degree requirements. The key stakeholders

invested their valuable time, providing the project leader with oversight and guidance throughout the project. The laboratory analysis of lipoprotein levels was performed as part of the standard of care to monitor the participants' health conditions. The project leader utilized a personal computer for electronic activities related to the project. The clinic provided access, at no additional cost to them, to the EMR.

Data Analysis

Descriptive statistics were utilized to summarize the collected data qualitatively. It was planned for inferential statistics to be used to compare quantitative data to determine if the clinical question was sufficiently answered. It is important to note that completion data were limited to qualitative data. One participant completed the questionnaire at the end of the intervention period. None of the project participants returned to the clinic for repeat laboratory analysis of the lipid panel. It was determined that a statistician did not need to be consulted for statistical analysis, as only one participant fulfilled the completion requirements.

Self-Efficacy

Asking participants about their compliance with lifestyle modifications helped to assess their adherence level. Levels of self-efficacy were measured among the participants using a self-reported questionnaire. A 4-point Likert scale was developed to assess self-efficacy at baseline and completion (1 = High, 2 = Moderate, 3 = Minimal, 4 = No knowledge). Fill-in-the-blank questions were utilized to assess adherence to lifestyle modifications. Baseline and completion results were compared to evaluate changes in the belief of the ability to adhere to lifestyle behavior changes (Appendix K). Changes in lifestyle behaviors are the evidence-based first-line therapy in the clinical management of hyperlipidemia. The results of this study will aid in illustrating the role self-efficacy plays in adherence to necessary lifestyle modifications.

Knowledge Base

To increase levels of self-efficacy participants must first be properly educated and empowered. Patient-centered education was provided over a period of 12 weeks. A 4-point Likert scale was developed to assess knowledge at both baseline and completion (Appendix K). Multiple-choice questions, consisting of one correct answer and three incorrect answers, were utilized to assess for changes in the knowledge base.

ASCVD Risk Score

Statistical analysis was performed to calculate the 10-year ASCVD risk estimation at the start of the project (Appendix I). The ASCVD risk score was shared with participants during week 1 to enhance awareness of the personal risk of developing heart disease or stroke within 10 years. None of the project participants returned to the clinic for repeat laboratory analysis of the lipid panel, which hindered efforts to provide participants with a repeat ASCVD risk assessment.

Fasting Lipid Panel

A baseline fasting lipid panel was analyzed at the start of the project. Repeat analysis near completion was planned, but not performed. One participant underwent repeat laboratory analysis after the 12-week intervention period. The remaining participants opted to not have repeat laboratory analyses. An individual's level of self-efficacy is directly impacted by performance outcomes, highlighting the importance of providing project participants with a comparison of their results (Bandura, 1977).

Section Four: Results

Twenty-five eligible participants were contacted, with 16 individuals responding (= 64% response rate). Nine people opted not to respond. Of the 16 responses received, nine individuals were unable to participate due to time constraints, one individual responded stating they were not

interested in education, and one individual was out of town on vacation. One eligible participant signed a consent form but failed to return the demographic form by the deadline and was subsequently dropped from the study. Five out of the 16 potential participants signed a consent form and completed the demographic data form, which equates to a participation rate of 31%. One participant returned the completion data, indicating a completion rate of 20%.

Participant Characteristics

The mean age of the participants was 45.6 years (range 31-48). Most of the participants were female (80%, *n* = 4), Caucasian (80% *n* = 4), and obese (80%, *n* = 4). All had a clinical diagnosis of hyperlipidemia. The average initial test score of 60% increased to 100% at the end of the project. It is important to note that the statistical significance was skewed related to the decreased sample size at the end of the project.

Descriptive Statistics

Descriptive statistics were utilized to summarize the baseline data. The mean cholesterol levels at baseline were as follows: TC = 233, TG = 190.8, HDL = 61.6, and LDL = 138. The mean diastolic blood pressure was 128.8, with a mean systolic blood pressure of 79.4. One participant (20%) was taking an anti-hypertensive. All participants denied a history of smoking, diabetes mellitus, use of a statin medication, and use of aspirin. The mean ASCVD risk score was 4.16, indicating a low risk of developing a heart attack or stroke within the next 10 years (Appendix I).

Measurable Outcomes

Only one participant completed the questionnaire at the end of the project. The study completion rate was 20%; therefore, comparing baseline and completion data was significantly limited. It was determined that the sample size prevented inferential statistical analysis. In this

case, descriptive statistical analysis of completion data was more meaningful. A t-test would have been beneficial in comparing outcomes to determine statistical significance, but there was a lack of quantitative data for sufficient analysis.

Self-Efficacy

The theoretical framework confirms that one's level of self-efficacy has a direct impact on the adaptation of sustainable lifestyle modifications (Bandura, 1977). Data from the literature review was also incorporated to demonstrate the relationship between levels of self-efficacy and sustainable lifestyle modifications (Tan et al., 2021). At the start of the study, 60% of participants believed cholesterol was a serious health condition and 40% of participants did not. 100% of the participants agreed that lifestyle behavior changes were necessary to manage their hyperlipidemia, with 20% reporting they had made the necessary changes. 20% of the participants reported a low level of self-efficacy. Patient-centered education and enhanced clinical support demonstrated an increase in the level of self-efficacy from "minimal" to "high." One participant noted, "I will admit that the last 4 weeks have scared me straight. Seeing how cholesterol actually affects my body as a whole. I really enjoyed week 5 (self-management behaviors) and have been making some pretty big changes to my diet as well as doing daily exercise".

Knowledge Base

There was a 100% completion rate for the pre test and a 20% completion rate for the post test. The baseline knowledge of hyperlipidemia was low at 50%. At completion, the knowledge base increased to 100%. Self-reported knowledge of a heart-healthy diet increased from "eating more Cheerios" to "incorporating a Mediterranean-style diet". It was also self-reported that the

intervention increased knowledge of hyperlipidemia: “The more I learn, the less scary the whole thing feels”.

ASCVD Risk Score

An updated ASCVD risk score was unable to be evaluated. Awareness of personal risk for heart disease and stroke was beneficial, as noted by one participant: “Thank you so much for sharing all of this with me! It has really helped me navigate through this High Cholesterol Journey”.

Fasting Lipid Panel

Statistical analysis of changes in lipoprotein levels was unable to be performed, as the participants opted against repeat laboratory analysis.

Section Five: Discussion

The economic burden associated with cardiovascular disease represents a major challenge for primary care providers. Primary care providers are in a unique position to support self-efficacy and facilitate adherence to lifestyle behavior changes (Dineen-Griffin et al., 2019). The 2019 ACC/AHA lipid guidelines reflect the complexity of the clinical management of hyperlipidemia (Reiter-Brennan et al., 2020). The ACC/AHA (2019) guidelines recommend integrating patient-centered education and shared decision-making to meet the individual needs of each patient (Reiter-Brennan et al., 2020). Treatment recommendations should be based on personal ASCVD risk for maximum benefit (Reiter-Brennan et al., 2020). Evidence-based lifestyle modifications are evidence-based first-line treatment recommendations (Reiter-Brennan et al., 2020; Shin et al., 2020; Su et al., 2021). Poor adherence to lifestyle modifications can contribute to disease progression. This is concerning given the elevated risk of serious ASCVD events associated with untreated hyperlipidemia (Reiter-Brennan et al., 2020).

Implications for Practice

Despite the lack of statistical significance, the study intervention is of clinical and practical importance to the clinic, as well as to the community. It is well-established that patient-centered education has a direct impact on adherence to lifestyle modifications (Reiter-Brennan et al., 2020; Shin et al., 2020; Su et al., 2021). Self-efficacy has recently been recognized in nursing research as a critical factor for the sustainment of necessary lifestyle modifications. Patients of lower economic status with cardiovascular disease, such as the population served by the clinic, have poorer health outcomes (Tanguturi et al., 2020). Providing patient-centered education and enhanced clinical support is a cost-effective approach to improving health outcomes. The health risks related to hyperlipidemia are cumulative and evidence shows enhanced clinical support leads to improvements in health outcomes and reduces the economic impact associated with chronic diseases, such as hyperlipidemia (Dineen-Griffin et al., 2019). Promoting self-efficacy can be integrated into routine clinical practice, facilitating a patient-centered approach and shared decision-making (Dineen-Griffin et al., 2019).

Project Limitations

Most notably, the study findings would have been more statistically significant with a larger sample size. The sample size also limited the general population's representation, adversely impacting the study findings' generalizability. A lack of compliance among participants also contributed to limited statistical analysis. Offering an incentive for participation could have increased participation and compliance. Systematic bias was intentionally introduced into the study design by the project leader. Study findings were limited to those with a clinical diagnosis of hyperlipidemia or elevated lipoprotein levels, which limited the generalization of findings. Self-selection bias limited the use of data collected.

Sustainability

The study intervention would be simple for the clinic to sustain, as it is low-cost and low-risk for both the community served and the clinic. Primary care providers are often the primary point of contact for patients, which creates ample opportunities for sustainable changes to the model and delivery of patient care (Dineen-Griffin et al., 2019). Key stakeholders are motivated to embrace evidence-based practice changes. Discussions with key stakeholders aided in garnering buy-in for integration and continued use of the educational materials.

Dissemination Plan

An informal discussion was held with key stakeholders to share the study findings. There are plans in place to develop an informational flyer, based on the study findings, to distribute to patients within the clinic. This will aid in increasing awareness of the clinical significance of hyperlipidemia, knowledge base, and self-efficacy, all of which have demonstrated promising results in improving adherence to lifestyle modifications and personal ASCVD risk reduction. The study findings can also be utilized as the basis for additional studies related to self-efficacy and adherence to lifestyle modifications. An application has been filed to present the project at the Virginia Council of Nurse Practitioners Annual Conference, which is scheduled for March 26-29, 2025.

Conclusion

Hyperlipidemia is among the most common chronic conditions diagnosed and treated in primary care. Professional guidelines highlight the fundamental role of lifestyle modifications in ASCVD risk reduction. Research has firmly established a correlation between self-efficacy and sustainable lifestyle modifications. The lack of knowledge and awareness of hyperlipidemia among primary care patients signaled the need for enhanced patient education to improve self-

efficacy. Levels of self-efficacy, knowledge base related to hyperlipidemia, and ASCVD risk score all play a critical role in adherence to appropriate treatment recommendations. Patient-centered education and enhanced clinical support can significantly increase self-efficacy, thereby increasing adherence to evidence-based lifestyle modifications to decrease ASCVD risk. Treatment recommendations should be based on personal ASCVD risk scores and customized to patient preferences, paying close attention to socioeconomic factors to maximize benefit.

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References

Abbasi, S., Khan, A., & Choudhry, M. W. (2024). New insights into the treatment of hyperlipidemia: Pharmacological updates and emerging treatments. *Cureus, 16*(6), e63078. https://doi.org/10.7759/cureus.63078

Agarwala, A., Petersen, K. S., Jafari, F., & Kris-Etherton, P. M. (2022). Dietary management of dyslipidemia and the impact of dietary patterns on lipid disorders. *Progress in Cardiovascular Diseases, 75*, 49-58. https://doi.org/10.1016/j.pcad.2022.11.003

American Heart Association (AHA). (2018). Cholesterol management guide for health care practitioners. *Cholesterol Guide for HC Practitioners.* https://www.heart.org/-/media/Files/Health-Topics/Cholesterol/Cholesterol-guide-for-HC-Practitioners-English.pdf

Arnett, D. K., Blumenthal, R. S., Albert, M. A., Buroker, A. B., Goldberger, Z. D., Hahn, E. J., Himmelfarb, C. D., Khera, A., Lloyd-Jones, D., McEvoy, J. W., Michos, E. D., Miedema, M. D., Muñoz, D., Smith, S. C., Virani, S. S., Williams, K. A., Yeboah, J., & Ziaeian, B. (2019). 2019 ACC/AHA guideline on the primary prevention of cardiovascular disease: A report of the American College of Cardiology/American Heart Association task force on clinical practice guidelines. *Journal of the American College of Cardiology, 74*(10), e177-e232. https://doi.org/10.1016/j.jacc.2019.03.010

Arnold, S. V., Cannon, C. P., de Lemos, J. A., Rosenson, R. S., Ballantyne, C. M., Liu, Y., Alam, S., Mues, K. E., Bhatt, D. L., Kosiborod, M., & the GOULD Investigators. (2021). What do US physicians and patients think about Lipid-Lowering therapy and goals of treatment? Results from the GOULD registry. *Journal of the American Heart Association, 10*(16), e020893-e020893. https://doi.org/10.1161/JAHA.120.020893

Ballard-Hernandez, J., & Sall, J. (2023). Dyslipidemia update. *The Nursing Clinics of North America, 58*(3), 295-308. https://doi.org/10.1016/j.cnur.2023.05.002

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*(2), 191-215. https://doi.org/10.1037/0033-295X.84.2.191

Berberich, A. J., & Hegele, R. A. (2022). A modern approach to dyslipidemia. *Endocrine Reviews, 43*(4), 611–653. https://doi.org/10.1210/endrev/bnab037

Beyece İncazli, S., Özer, S., & Kayikçioğlu, M. (2022). Evaluation of the effectiveness of individually tailored lifestyle intervention in patients with familial hypercholesterolemia. *The Journal of Cardiovascular Nursing, 37*(5), 465-474. https://doi.org/10.1097/JCN.0000000000000896

Blinnikova, K., Cohen, C. W., & McKeag, I. D. (2024). Lifestyle intervention for the prevention of cardiovascular disease. *Primary Care, 51*(1), 13-26. https://doi.org/10.1016/j.pop.2023.07.001

Bond, Z., Scanlon, T., & Judah, G. (2021). Systematic review of RCTs assessing the effectiveness of mHealth interventions to improve statin medication adherence: Using the behaviour-change technique taxonomy to identify the techniques that improve adherence. *Healthcare (Basel), 9*(10), 1282. https://doi.org/10.3390/healthcare9101282

Bordoni, B., & Hill, M. F. (2023). *Hyperlipidemia*. StatPearls [Internet]. https://www.ncbi.nlm.nih.gov/books/NBK559182/

Campbell, E. K., Fidahusain, M., & Campbell Ii, T. M. (2019). Evaluation of an eight-week whole-food plant-based lifestyle modification program. *Nutrients, 11*(9), 2068. https://doi.org/10.3390/nu11092068

Centers for Disease Control and Prevention (CDC). (2023). *High cholesterol facts*. Cholesterol

Home. https://www.cdc.gov/cholesterol/facts.htm

Clebak, K. T., & Dambro, A. B. (2020). Hyperlipidemia: An evidence-based review of current guidelines. *Curēus, 12*(3), e7326-e7326. https://doi.org/10.7759/cureus.7326

Das, P., & Ingole, N. (2023). Lipoproteins and their effects on the cardiovascular system. *Cureus*, *15*(11), e48865. https://doi.org/10.7759/cureus.48865

Di Fusco, S. A., Arca, M., Scicchitano, P., Alonzo, A., Perone, F., Gulizia, M. M., Gabrielli, D., Oliva, F., Imperoli, G., & Colivicchi, F. (2023). Lipoprotein(a): A risk factor for atherosclerosis and an emerging therapeutic target. *Heart (British Cardiac Society)*, *109*(1), 18-25. https://doi.org/10.1136/heartjnl-2021-320708

Dineen-Griffin, S., Garcia-Cardenas, V., Williams, K., & Benrimoj, S. I. (2019). Helping patients help themselves: A systematic review of self-management support strategies in primary health care practice. PloS One, 14(8), e0220116. https://doi.org/10.1371/journal.pone.0220116

Formisano, E., Pasta, A., Cremonini, A. L., Di Lorenzo, I., Sukkar, S. G., & Pisciotta, L. (2021). Effects of a mediterranean diet, dairy, and meat products on different phenotypes of dyslipidemia: A preliminary retrospective analysis. *Nutrients*, *13*(4), 1161. https://doi.org/10.3390/nu13041161

Iowa Model Collaborative. (2017). Iowa model of evidence-based practice: Revisions and validation. *Worldviews on Evidence-Based Nursing*, *14*(3), 175-182. https://doi.org/10.1111/wvn.12223

Kang, E., Kim, K. H., Cho, Y. M., Park, S. M., Kim, Y., Lee, H., Rhee, Y. E., Kim, S., & Yun, Y. H. (2021). Effect of changes in patient's self-management strategies on clinical outcomes: Evidence from a cohort study of patients with diabetes, hypertension, and

hyperlipidemia. *International Journal of Behavioral Medicine, 28*(4), 479-487. https://doi.org/10.1007/s12529-020-09937-x

Li, Z., Zhu, G., Chen, G., Luo, M., Liu, X., Chen, Z., & Qian, J. (2022). Distribution of lipid levels and prevalence of hyperlipidemia: Data from the NHANES 2007–2018. *Lipids in Health and Disease, 21*(1), 1-111. https://doi.org/10.1186/s12944-022-01721-y

Lloyd-Jones, D. M., Braun, L. T., Ndumele, C. E., Smith, J., Sidney C, Sperling, L. S., Virani, S. S., & Blumenthal, R. S. (2019). Use of risk assessment tools to guide decision-making in the primary prevention of atherosclerotic cardiovascular disease: A special report from the American Heart Association and American College of Cardiology. *Journal of the American College of Cardiology, 73*(24), 3153-3167. https://doi.org/10.1016/j.jacc.2018.11.005

McEwen, M., & Wills, E. M. (2019). *Theoretical basis for nursing* (5th ed.). Wolters Kluwer Health.

Melnyk, B. M., & Fineout-Overholt, E. (2019). *Evidence-based practice in nursing and healthcare: A guide to best practice* (4th ed.). Wolters Kluwer.

Murphy, M. P., Staffileno, B. A., & Foreman, M. D. (Eds.). (2018). *Research for advanced practice nurses: From evidence to practice* (3rd ed.). Springer Publishing Company, LLC.

Pallarés-Carratalá, V., Barrios, V., Fierro-González, D., Polo-García, J., & Cinza-Sanjurjo, S. (2023). Cardiovascular risk in patients with dyslipidemia and their degree of control as perceived by primary care physicians in a survey-TERESA-opinion study. *International Journal of Environmental Research and Public Health, 20*(3), 2388. https://doi.org/10.3390/ijerph20032388

Reiter-Brennan, C., Osei, A. D., Iftekhar Uddin, S. M., Orimoloye, O. A., Obisesan, O. H., Mirbolouk, M., Blaha, M. J., & Dzaye, O. (2020). ACC/AHA lipid guidelines: Personalized care to prevent cardiovascular disease. *Cleveland Clinic Journal of Medicine, 87*(4), 231-239. https://doi.org/10.3949/ccjm.87a.19078

Rodriguez, D., Lavie, C. J., Elagizi, A., & Milani, R. V. (2022). Update on omega-3 polyunsaturated fatty acids on cardiovascular health. *Nutrients, 14*(23), 5146. https://doi.org/10.3390/nu14235146

Shin, W., Shin, S., Lee, J., Kang, D., & Lee, J. E. (2021). Carbohydrate intake and hyperlipidemia among population with high-carbohydrate diets: The health examinees gem study. *Molecular Nutrition & Food Research, 65*(3), 2000379-2000391. https://doi.org/10.1002/mnfr.202000379

Su, L., Mittal, R., Ramgobin, D., Jain, R., & Jain, R. (2021). Current management guidelines on hyperlipidemia: The silent killer. *Journal of Lipids, 2021*, 1-5. https://doi.org/10.1155/2021/9883352

Tanguturi, V. K., Kennedy, K. F., Virani, S. S., Maddox, T. M., Armstrong, K., & Wasfy, J. H. (2020). Association between poverty and appropriate statin prescription for the treatment of hyperlipidemia in the United States: An analysis from the ACC NCDR PINNACLE registry. *Cardiovascular Revascularization Medicine, 21*(8), 1016-1021. https://doi.org/10.1016/j.carrev.2019.12.026

University of Michigan Library. (2024). *Levels of evidence*. Levels of Evidence - Nursing - Research Guides at the University of Michigan Library. https://guides.lib.umich.edu/c.php?g=282802&p=10153024

U.S. Preventive Services Taskforce (USPSTF). (2022). *Statin use for the primary prevention of*

cardiovascular disease in adults: Preventive medication. Recommendation: Statin Use for the Primary Prevention of Cardiovascular Disease in Adults: Preventive Medication | United States Preventive Services Taskforce. https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/statin-use-in-adults-preventive-medication

Zaid, A. B., Awad, S. M., El-Abd, M. G., Saied, S. A., Almahdy, S. K., Saied, A. A., Elmalawany, A. M., AboShabaan, H. S., & Saleh, H. S. (2024). Unraveling the controversy between fasting and nonfasting lipid testing in a normal population: A systematic review and meta-analysis of 244,665 participants. *Lipids in health and disease*, *23*(1), 199. https://doi.org/10.1186/s12944-024-02169-y

Zhao, S., Zhong, J., Sun, C., & Zhang, J. (2021). Effects of aerobic exercise on TC, HDL-C, LDL-C and TG in patients with hyperlipidemia: A protocol of systematic review and meta-analysis. *Medicine*, *100*(10), e25103-e25103. https://doi.org/10.1097/MD.0000000000025103

Appendix A

Level of Evidence Matrix

Article Title, Author, etc.	Study Purpose	Sample Characteristics	Methods	Study Results	Level of Evidence	Study Limitations	Would Use as Evidence to Support a Change? (Yes or No) Provide Rationale.
Zhao, S., Zhong, J., Sun, C., & Zhang, J. (2021). Effects of aerobic exercise on TC, HDL-C, LDL-C, and TG in patients with hyperlipidemia: A protocol of systematic review and meta-analysis. *Medicine, 100* (10), e25103-e25103. https://doi.org/10.1097/MD.0000000000025103	To evaluate the effect of aerobic exercise on total cholesterol (TC) and triglycerides (TG) in patients with hyperlipidemia (Zhao et al., 2021).	The Cochrane Handbook for Systematic Reviews of Interventions was used to conduct the systematic review (Zhao et al., 2021). Randomized controlled trials focusing on evaluating the effectiveness of aerobic exercise on TC and TG levels in patients with hyperlipidemia were included (Zhao et al., 2021).	Systematic review and meta-analysis of Google Scholar, PubMed, Web of Science, the Cochrane Library, and EMBASE (Zhao et al., 2021).	Aerobic exercise lowers serum TG levels, TC, and low-density lipoprotein (LDL) levels, while increasing high-density lipoprotein (HDL) levels, in patients with hyperlipidemia (Zhao et al., 2021). Hyperlipidemia has been shown to damage both brain structure and function (Zhao et al., 2021).	Level 1: Systematic Review/Meta-analysis of randomized controlled trials (University of Michigan Library, 2024).	Variations within the randomized controlled trials in sample characteristics, exercise intensity, frequency, and duration, may contribute to different results of the specific effects of aerobic exercise on the blood lipid levels of patients with hyperlipidemia (Zhao et al., 2021).	Yes, because meta-analyses and systematic reviews are considered the highest levels of evidence (University of Michigan Library, 2024).

Su, L., Mittal, R., Ramgobin, D., Jain, R., & Jain, R. (2021). Current management guidelines on hyperlipidemia: The silent killer. *Journal of Lipids, 2021*, 1-5. https://doi.org/10.1155/2021/9883352	Provides a review of the pathophysiology of atherosclerotic disease, current lipid management guidelines, and new treatment options (Su et al., 2021).	N/A- no sample included in this article	A review of the 2018 American College of Cardiology/American Heart Association (ACC/AHA) guidelines, as well as new medications that have been developed to lower cholesterol, was provided (Su et al., 2021).	Adherence to ACC/AHA guidelines has proven to be effective at preventing coronary events associated with hyperlipidemia (Su et al., 2021).	Level 7: Expert opinion based on experimental evidence (University of Michigan Library, 2024).	There is no statistical validity (University of Michigan Library, 2024). Recommendations based on expert opinion may be biased.	Yes, while the lowest level of evidence, expert opinion provides background information and evidence-based support (University of Michigan Library, 2024).
Beyece İncazli, S., Özer, S., & Kayikçioğlu, M. (2022). Evaluation of the effectiveness of individually tailored lifestyle intervention in patients with familial hypercholesterolemia. *The Journal of Cardiovascular Nursing, 37*(5), 465-474. https://doi.org/10.1097/JCN.0000000000000896	Evaluate the effectiveness of a tailored lifestyle intervention on healthy lifestyle habits and self-management in patients with familial hypercholesterolemia (Beyece İncazli & Kayikçioğlu, 2022).	120 patients with familial hypercholesterolemia for at least 6 months, between 18 to 65 years of age, having no communication problems, and able to use a text messaging service (Beyece İncazli & Kayikçioğlu, 2022).	Randomized controlled experimental study- 120 patients were randomly assigned to receive either education and counseling based upon the Transtheoretical Model of Health Behavioral Change or conventional clinical education (Beyece İncazli &	Education and counseling based upon the Transtheoretical Model of Health Behavioral Change resulted in a significant improvement in healthy lifestyle habits and adherence to self-management (Beyece İncazli &	Level 3: Randomized control trial (University of Michigan Library, 2024).	Beyece İncazli & Kayikçioğlu, (2022), cite the limited duration of study and the study site (a tertiary care center) as study limitations.	Yes, randomized control trials allow for comparison between an intervention group and a control group (University of Michigan Library, 2024). This aids in establishing a foundation for analyzing cause and effect (Murphy et al., 2018).

			Kayikçioğlu, 2022).	Kayikçioğlu, 2022).			
Bond, Z., Scanlon, T., & Judah, G. (2021). Systematic review of RCTs assessing the effectiveness of mHealth interventions to improve statin medication adherence: Using the behaviour-change technique taxonomy to identify the techniques that improve adherence. *Healthcare, 9*(10), 1282. https://doi.org/10.3390/healthcare9101282	To identify the effectiveness of Behaviour-Change Techniques in mHealth interventions for statin medication adherence (Bond et al., 2021).	Randomized control trials measuring the effectiveness of mHealth interventions against the current standard of care to improve statin adherence in patients prescribed statins for prevention of coronary events, published in English from January 1, 2000–July 17, 2020 (Bond et al., 2021).	A systematic review of randomized controlled trials was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement (Bond et al., 2021). Patients of any age who were prescribed statins in any setting for the primary or secondary prevention of coronary events associated with hyperlipidemia (Bond et al., 2021).	mHealth interventions were found to be highly effective in improving statin medication adherence (Bond et al., 2021). Providing information about health consequences, feedback on adherence behavior, and enlisting partner support were additional recommendations.	Level 1: Systematic Review/Meta-analysis of randomized controlled trials (University of Michigan Library, 2024).	Further research is necessary to understand the generalizability of suggested intervention techniques across varying settings and demographics (Bond et al., 2021).	Yes, the highest level of supporting evidence. This article provided the best evidence from the literature to answer a clinical question (University of Michigan Library, 2024). Randomized control trials provide strong evidence for cause and effect (University of Michigan Library, 2024).

Shin, W., Shin, S., Lee, J., Kang, D., & Lee, J. E. (2021). Carbohydrate intake and hyperlipidemia among population with high-carbohydrate diets: The health examinees gem study. *Molecular Nutrition & Food Research, 65*(3), 2000379-2000391. https://doi.org/10.1002/mnfr.202000379	To assess the association between carbohydrate intake and hyperlipidemia (Shin et al., 2021).	93,870 participants of the Health Examinees Study, a large-scale genomic community-based prospective cohort study conducted in Korea from 2004 to 2013 (Shin et al., 2021).	An interview-based survey was utilized to collect information on socio-demographic factors, lifestyle factors, disease history, and dietary habits (Shin et al., 2021).	Low-quality carbohydrate intake was associated with a high prevalence of high TGs and low HDL (Shin et el., 2021).	Level 4: Cross-sectional study	Could not determine the causal relationship between carbohydrate intake and hyperlipidemia (Shin et al., 2021).	No, this study fails to establish a causal relationship. A cross-sectional study is merely an observation of a phenomenon.
Tanguturi, V. K., Kennedy, K. F., Virani, S. S., Maddox, T. M., Armstrong, K., & Wasfy, J. H. (2020). Association between poverty and appropriate statin prescription for the treatment of hyperlipidemia in the United States: An analysis from the ACC NCDR PINNACLE registry. *Cardiovascular Revascularization Medicine, 21*(8), 1016. https://doi.org/10.1016/j.carrev.2019.12.026	To assess the association between statin therapy and income level to explain poorer health outcomes (Tanguturi et al., 2020).	All patients over 18 years of age in the National Cardiovascular Data Registry's Practice Innovation and Clinical Excellence Registry, a national, voluntary clinical registry of outpatient cardiovascular visits, from 2008 through 2016. Those with missing risk factors to determine their risk of coronary artery disease and no zip code	Data from the registry was analyzed to investigate the relationship between appropriate statin therapy and patient income level between 2008 and 2016 (Tanguturi et al., 2020). The primary focus was on estimated income (Tanguturi et al., 2020).	A statistically significant association was determined between patient income level and likelihood of receiving statin therapy (Tanguturi et al., 2020).	Level 4: Cohort study (University of Michigan Library, 2024).	Study findings are limited by ecological inference bias, assuming equal mean incomes within zip codes (Tanguturi et al., 2020). Clinics that serve low-income groups may not be able to participate in the registry and may be inadequately captured in	Yes, cohort studies can aid with determining differences in outcomes (Murphy et al., 2018).

		were excluded from the study. Data from 1,655,723 patients remained after the application of inclusion and exclusion criteria (Tanguturi et al., 2020).				the study (Tanguturi et al., 2020).	
Clebak, K. T., & Dambro, A. B. (2020). Hyperlipidemia: An evidence-based review of current guidelines. *Curēus, 12*(3), e7326-e7326. https://doi.org/10.7759/cureus.7326	To provide a summary of hyperlipidemia treatment guidelines (Clebak & Dambro, 2020).	A comparison of current international guidelines for the treatment of hyperlipidemia is provided.	A review of current international guidelines and studies on statin therapy versus non-statin therapy is provided.	The use of statins to treat hyperlipidemia has been widely accepted and recommended (Clebak & Dambro, 2020). The evidence for non-statin treatments is mixed (Clebak & Dambro, 2020).	Level 1: Systematic Review/Meta-analysis of randomized controlled trials (University of Michigan Library, 2024).	The evidence for non-statin treatments is mixed (Clebak & Dambro, 2020).	Yes, the highest level of supporting evidence. This article provided the best evidence from the literature to answer a clinical question (University of Michigan Library, 2024).
Agarwala, A., Petersen, K. S., Jafari, F., & Kris-Etherton, P. M. (2022). Dietary management of dyslipidemia and the impact of dietary patterns on lipid disorders. *Progress in*	To provide healthcare providers with a review of evidence-based	N/A- no sample included in this article	Strategies are provided that can be used to provide patient-	Effective diet-related interactions involve an enhanced	Level 1: Evidence-based clinical practice	The challenge to identify strategies to promote	Yes, several separate but similar studies are assessed to

Cardiovascular Diseases, 75, 49-58. https://doi.org/10.1016/j.pcad.2022.11.00	healthy dietary patterns for decreasing LDL and/or TG (Agarwala et al., 2022).		centered diet-related counseling and education.	understanding of the broader context for diet choices (Agarwala et al., 2022).	guidelines based on systematic reviews of randomized clinical trials (University of Michigan Library, 2024).	patient adherence to achieve maximal lipid-lowering effects with healthy lifestyle habits remains (Agarwala et al., 2022).	determine significance (University of Michigan Library, 2024). Provides support for necessary components of cholesterol management.
Arnold, S. V., Cannon, C. P., de Lemos, J. A., Rosenson, R. S., Ballantyne, C. M., Liu, Y., Alam, S., Mues, K. E., Bhatt, D. L., Kosiborod, M., & the GOULD Investigators. (2021). What do US physicians and patients think about Lipid-Lowering therapy and goals of treatment? Results from the GOULD registry. *Journal of the American Heart Association, 10*(16), e020893-e020893. https://doi.org/10.1161/JAHA.120.020893	To assess patient and physician understanding of hyperlipidemia and associated treatment.	Participating patients had one coronary event and LDL > 70. All patients were on statin therapy for at least 4 weeks before enrollment.	Data was collected from a US-based registry designed to define hyperlipidemia treatment patterns among patients (Arnold et al., 2021). Eligible patients were enrolled from December 2016- July 2018. Patients were followed for up to 2 years.	Knowledge gaps play a significant role in poorer adherence to medications and healthy lifestyle habits (Arnold et al., 2021).	Level 4: Cohort study, follows patients who have a particular condition over time (University of Michigan Library, 2024).	Not as reliable as a randomized control trial (University of Michigan Library, 2024). Study participants were not diverse regarding age, race, and socioeconomic status (Arnold et al., 2021).	Yes, education and awareness of knowledge gaps can influence awareness and adherence to treatment (Arnold et al., 2021).
Pallarés-Carratalá, V., Barrios, V., Fierro-González, D., Polo-García, J., & Cinza-Sanjurjo, S. (2023). Cardiovascular risk in patients with dyslipidemia and their degree of control as perceived by primary care physicians in a survey-TERESA-	To evaluate the opinion of primary care providers on the magnitude of dyslipidemia in	Primary care physicians from across Spain were invited to participate in an online survey. A total of 302	Retrospective data was collected related to the experience, knowledge, and routine	Results showed a widely varying perception of the prevalence of	Level 6 Observational study	All study variables were aggregated, which limits the ability to establish	Yes, provides a rationale for quality improvement (Murphy et al., 2018). However,

opinion study. *International Journal of Environmental Research and Public Health, 20*(3), 2388. https://doi.org/10.3390/ijerph20032388	their clinical practice.	primary care physicians participated.	clinical practice of the participating physician (Pallarés-Carratalá et al., 2023).	hyperlipidemia (Pallarés-Carratalá et al., 2023).		causal relationships (Pallarés-Carratalá et al., 2023).	there is a lack of statistical significance, and caution should be used.
Reiter-Brennan, C., Osei, A. D., Iftekhar Uddin, S. M., Orimoloye, O. A., Obisesan, O. H., Mirbolouk, M., Blaha, M. J., & Dzaye, O. (2020). ACC/AHA lipid guidelines: Personalized care to prevent cardiovascular disease. *Cleveland Clinic Journal of Medicine, 87*(4), 231-239. https://doi.org/10.3949/ccjm.87a.19078	Provides an in-depth review of updates to evidence-based guidelines. Guidance for effective management of hyperlipidemia.	The 2018 and 2019 guidelines from the American College of Cardiology and American Heart Association.	A systematic review of evidence-based clinical practice guidelines with the support of clinical study recommendations.	Personalized treatment plans are recommended for each patient. Provides updated patient risk assessment and treatment options for the primary and secondary prevention of hyperlipidemia. Treatment algorithms are provided for specific patient subgroups.	Level 1: Evidence-based clinical practice guidelines based on systematic reviews	Professional recommendations have the potential to be influenced by subjective opinions and clinical experience.	Yes, provides guidance and support for necessary components of hyperlipidemia management. Provides evidence-based recommendations for changes in clinical practice.
Berberich, A. J., & Hegele, R. A. (2022). A modern approach to dyslipidemia. *Endocrine Reviews, 43*(4), 611–653. https://doi.org/10.1210/endrev/bnab037	Provides a simplified approach to the management of patients with hyperlipidemia.	A systematic review of current evidence and guidelines on hyperlipidemia management. A	A systematic review of previous and new research knowledge to highlight new developments.	Encouraging a heart-healthy diet, increased physical activity and weight loss	Level 1-Systematic review	The recommendations fail to take an individualizing approach and may be	Yes, the highest level of supporting evidence. Provides a summary of available

		comprehensive review of professional guidelines from the American College of Cardiology, American Heart Association, Adult Treatment Panel, Canadian Cardiovascular Society, European Atherosclerosis Society, European Society of Cardiology, National Cholesterol Education Program, National Heart, Lung, and Blood Institute, National Lipid Association, and the US Preventative Services Task Force.	In-depth discussion of current treatment options and their role in the management of hyperlipidemia.	are the cornerstones of hyperlipidemia. The ASCVD risk assessment should be utilized to guide shared decision-making and treatment options.		inadequate for certain subgroups.	evidence, conducted by an expert (University of Michigan Library, 2024).
Li, Z., Zhu, G., Chen, G., Luo, M., Liu, X., Chen, Z., & Qian, J. (2022). Distribution of lipid levels and prevalence of hyperlipidemia: Data from the NHANES 2007–2018. *Lipids in Health and Disease, 21*(1), 1-111.	To explore the prevalence of hyperlipidemia among population subgroups and analyze factors	Pertinent clinical data from 15,499 participants aged 18 years and older,	Cross-sectional and multifactorial logistic regression analyses were	Sex, age, race, and smoking status were identified as significant	Level 4-Cross-sectional study	A cross-sectional study is limited to a specific time frame.	Yes, this type of observational study is useful when analyzing

https://doi.org/10.1186/s12944-022-01721-y	that impact mean lipid levels.	which were representative of residents of the United States residents, was reviewed from 2007 to 2018.	performed to assess the mean distribution of lipids and the prevalence of hyperlipidemia among subpopulations.	factors that impact the mean lipid levels and the prevalence of hyperlipidemia.			associations between outcomes and exposure to factors of interest.
Ballard-Hernandez, J., & Sall, J. (2023). Dyslipidemia update. *The Nursing Clinics of North America, 58*(3), 295-308. https://doi.org/10.1016/j.cnur.2023.05.002	Provides a clinical update on hyperlipidemia management. Compares and contrasts professional guidelines to analyze the similarities, differences, and discordance. Highlights the need for additional research to support changes in current clinical practice.	Review of clinical practice guidelines from various professional societies.	Cholesterol guidelines published by the American College of Cardiology, American Heart Association the US Preventive Services Task Force, the Department of Veterans Affairs, the Department of Defense (DoD), the Canadian Cardiovascular Society, and the European Society of Cardiology.	Lifestyle management is the key to effective primary and secondary management of hyperlipidemia. Statins remain the cornerstone of pharmacologic management. Certain population subgroups require an individualized treatment approach.	Level 1-Systematic review	There is conflicting guidance between various professional guidelines and recommendations.	Yes. Systematically developed guidelines aid clinicians and patients in making decisions about treatment options.
Formisano, E., Pasta, A., Cremonini, A. L., Di Lorenzo, I., Sukkar, S. G., & Pisciotta, L. (2021). Effects of a mediterranean diet, dairy, and meat products on different phenotypes of	To evaluate the effect of food intake and various sources of saturated fatty	A retrospective analysis was performed on medical charts of 53 women	Data related to clinical characteristics, lipid profile, and food habits	Dietary recommendations should focus on the sources of	Level 4: Cohort study, follows patients		No. While it provides support for the scholarly

dyslipidemia: A preliminary retrospective analysis. *Nutrients, 13*(4), 1161. https://doi.org/10.3390/nu13041161	acids on lipid profiles. All patients were treated at the Lipid Clinic, IRCCS Policlinic San Martino Hospital, University of Genoa, Italy, from February to July 2019.	and 53 men. All participants were diagnosed with hyperlipidemia.	was collected at baseline and after three months of follow-up counseling.	saturated fatty acids rather than the traditional approach of reducing saturated fatty acids.	who have a particular condition over time (University of Michigan Library, 2024).		project, it is a foreign study.

Appendix B

CITI Training Certification

CITI PROGRAM

Completion Date 20-Feb-2024
Expiration Date 20-Feb-2027
Record ID 61379320

This is to certify that:

Kelly Caniglia

Not valid for renewal of certification through CME.

Has completed the following CITI Program course:

Biomedical Research - Basic/Refresher
(Curriculum Group)
Biomedical & Health Science Researchers
(Course Learner Group)
1 - Basic Course
(Stage)

Under requirements set by:

Liberty University

CITI
Collaborative Institutional Training Initiative
101 NE 3rd Avenue, Suite 320
Fort Lauderdale, FL 33301 US
www.citiprogram.org

Generated on 20-Feb-2024. Verify at www.citiprogram.org/verify/?wfa2e7aad-5d53-4637-aff6-bb0f4fed6d33-61379320

Appendix C

Letter of Support from Project Site

February 19, 2024

Attention: IRB
Liberty University
Lynchburg, Virginia

IRB Members:

Kelly Caniglia, MSN, RN, Liberty University Doctor of Nursing Practice Student (Principal Investigator), and Dr. Debra Maddox, DNP, FNP-C, Assistant Professor of Nursing, and DNP Scholarly Project Chair (Faculty Chair) have proposed to conduct Kelly Caniglia's Doctor of Nursing Practice Scholarly Project: Hyperlipidemia Education to Increase Awareness of Atherosclerotic Risk Factors and Reduce Cardiovascular Risk at [redacted] The Scholarly Project will consist of a pretest and a post-test to ascertain knowledge and understanding of hyperlipidemia. The educational intervention will consist of bi-weekly telehealth visits, as a group, which will last approximately 15 minutes. PowerPoint and Microsoft Teams technology will be utilized to provide patient education to increase awareness of lifestyle changes, including diet, exercise, and medication compliance. Each visit will focus on a different topic. An educational handout will also be developed and provided at the beginning of the project, as well as reinforced during the bi-weekly group meetings. A pre-test will measure the patients' knowledge of hyperlipidemia, associated risk factors, and management of this chronic condition. A post-test will be administered to the patients at the end of the 12 weeks to determine if the patient's knowledge base has increased. Additional questions will be added to capture information about lifestyle changes, such as an increase in the amount of exercise, improvements in eating a low-fat diet, and taking medications as prescribed.

[redacted] is committed to providing high-quality, comprehensive, individualized care for patients, facilitated by the pursuit of quality improvement. Kelly Caniglia's Doctor of Nursing Practice Scholarly Project reflects the commitment to providing patients with optimal quality health care. [redacted] is pleased to support Kelly Caniglia's Scholarly project: Hyperlipidemia Education to Increase Awareness of Atherosclerotic Risk Factors and Reduce Cardiovascular Risk. Feel free to contact me if I can be of further assistance.

Respectfully,

[redacted]

Appendix D

Permission to use the Iowa Model of Evidence-Based Practice to Promote Quality Care

From: [redacted] - University of Iowa Hospitals and Clinics [redacted]

To: Caniglia, Kelly Lynn [redacted]

You don't often get email from [redacted] Learn why this is important

[EXTERNAL EMAIL: Do not click any links or open attachments unless you know the sender and trust the content.]

You have permission, as requested today, to review and/or reproduce The Iowa Model Revised: Evidence-Based Practice to Promote Excellence in Health Care. Click the link below to open.

Iowa Model - 2015.pdf

Copyright is retained by University of Iowa Hospitals and Clinics. Permission is not granted for placing on the internet.

Reference: Iowa Model Collaborative. (2017). Iowa model of evidence-based practice: Revisions and validation. Worldviews on Evidence-Based Nursing, 14(3), 175-182. doi:10.1111/wvn.12223

In written material, please add the following statement:
Used/reprinted with permission from the University of Iowa Hospitals and Clinics, copyright 2015. For permission to use or reproduce, please contact the University of Iowa Hospitals and Clinics at 319-384-9098.

Please contact UIHCNursingResearchandEBP@uiowa.edu or 319-384-9098 with questions.

Appendix E

Appendix F

Institutional Review Board Approval

LIBERTY UNIVERSITY.
INSTITUTIONAL REVIEW BOARD

April 23, 2024

Kelly Caniglia
Debra Maddox

Re: IRB Application - IRB-FY23-24-1753 HYPERLIPIDEMIA EDUCATION: ENHANCING PATIENT EDUCATION AND SELF-MANAGEMENT BEHAVIORS TO IMPROVE PATIENT OUTCOMES IN A RURAL CLINIC SETTING

Dear Kelly Caniglia and Debra Maddox,

The Liberty University Institutional Review Board (IRB) has reviewed your application in accordance with the Office for Human Research Protections (OHRP) and Food and Drug Administration (FDA) regulations and finds that your study does not meet the definition of human subjects research. This means you may begin your project with the data safeguarding methods mentioned in your IRB application.

Decision: No Human Subjects Research

Explanation: Your project is not considered human subjects research because evidence-based practice projects are considered quality improvement activities, which are not "designed to develop or contribute to generalizable knowledge" according to 45 CFR 46.102(l).

Please note that this decision only applies to your current application. Any modifications to your protocol must be reported to the Liberty University IRB for verification of continued non-human subjects research status. You may report these changes by completing a modification submission through your Cayuse IRB account.

For a PDF of your IRB letter, click on your study number in the My Studies card on your Cayuse dashboard. Next, click the Submissions bar beside the Study Details bar on the Study Details page. Finally, click Initial under Submission Type and choose the Letters tab toward the bottom of the Submission Details page.

Also, although you are welcome to use our recruitment and consent templates, you are not required to do so. **If you choose to use our documents, please replace the word *research* with the word *project* throughout both documents.**

If you have any questions about this determination or need assistance in determining whether possible modifications to your protocol would change your application's status, please email us at irb@liberty.edu.

Sincerely,

[redacted]

Research Ethics Office

Appendix G

Scholarly Project Participant Recruitment

Hello [Potential Participant],

As a doctoral candidate in the School of Nursing at Liberty University, I am conducting a quality improvement project on cholesterol education as part of the requirements for a doctoral degree. The purpose of my project is to teach patients with high cholesterol levels to actively identify challenges and solve problems associated with their chronic illness. I would like to invite you to join my project. Participants in my project must be a primary care patient of [redacted] at least 20 years of age, diagnosed with either hyperlipidemia (high cholesterol levels) or recent lab results indicating any form of high cholesterol. You must also have access to a reliable internet connection and email. Participating in this project is voluntary. Are you at least 20 years of age, diagnosed with either hyperlipidemia (high cholesterol levels) or recent lab results indicating any form of high cholesterol? Do you have access to a reliable internet connection and email?

- ["Yes" response:] Participants will be asked to take anonymous pre-and post-tests and participate in several online group meetings. It should take approximately 5 minutes each for the pre-and post-tests and 45 minutes for the educational sessions. The project will take 12 weeks to complete. Some identifying information will be requested for this project, but participant identities will not be disclosed.
- ["No" response:] Unfortunately, you do not meet my participant criteria. Thank you for your valuable time.

Would you be interested in participating in my project?

- ["Yes" response:] Great, could I get your email address to send you the consent form?
- ["No" response:] I understand. Thank you for your time.

A consent form containing additional information about my project will be emailed to you two weeks before the start of the education sessions. If you choose to participate, you must sign the consent document and return it to me via email within one week. Thank you for your time. Do you have any questions?

Appendix H

Consent for Participation in Scholarly Project

Principal Investigator: Kelly L. Caniglia, MSN, RN, CNOR, FNP/DNP Candidate, School of Nursing, Liberty University

Please read this entire form and ask questions before deciding whether to consent to participate in this project voluntarily. You are invited to participate in a quality improvement project at [redacted] To participate, you must be a primary care patient of the clinic, at least 21 years of age, diagnosed with either hyperlipidemia (high cholesterol levels) or recent lab results indicating high cholesterol. You must have access to a reliable internet connection and email. Participating in this project is voluntary. If you decide to participate, you are free to not answer any questions or withdraw at any time

What is the project about and why is it being done?
The project aims to provide patient education and increased clinical support to raise awareness of hyperlipidemia (high cholesterol levels), including the disease process, consequences, and risk factors of untreated hyperlipidemia. Healthy lifestyle choices and updated treatment recommendations will be reviewed to identify challenges associated with chronic illness actively.

What will happen if you take part in this project?
This project is anticipated to take 12 weeks to complete. If you agree to be an active participant in this project, you will be asked to do the following:

1. Complete a brief pre-test questionnaire before the start of the educational sessions, which should take no longer than five minutes. You will receive an educational handout, which will be emailed to you. You will also be provided with a summary of educational topics. This process should take no more than five minutes.
2. Ten online educational sessions will be provided on hyperlipidemia, the consequences of untreated hyperlipidemia, risk factors, and updated treatment options. These sessions are anticipated to last about 10-15 minutes. If you miss more than 2 educational sessions, you will be withdrawn from the project
3. During the final week, you will be emailed a post-test to complete and return via email. This should take no longer than five minutes.

How could you or others benefit from this project?
If you choose to participate in this project, you will have the opportunity to learn about hyperlipidemia and its treatment, which you would not receive if you did not participate. The direct benefits participants should expect from participating in this project include increased awareness of risk factors, increased knowledge of hyperlipidemia, healthy lifestyle habits, updated treatment options/recommendations, and awareness of individual challenges. Benefits to society include improved health of individuals, knowledge of the impact of healthy lifestyle choices, and awareness of updated treatment recommendations.

Appendix H (continued)

What risks might you experience from being in this project?
The potential risks from participating in this project are minimal, which means they are equal to the risks you would encounter in your everyday life. There are no anticipated risks.

How will your personal information be protected?
Records will be stored securely. Electronic data will be stored on a password-locked computer. Physical data will be stored in a locked file cabinet. The researcher and members of her doctoral committee will have access to all the collected data. Any information that could potentially identify you will be removed. Three years after the completion of this study, all electronic records will be deleted, and all physical records will be shredded.

What should you do if you decide to withdraw from the project?
You may skip any question on the questionnaires if you choose not to answer them. If you choose to withdraw from the project, please contact the project leader using the email address provided. Should you withdraw, the data collected will be destroyed and not included in this study.

Whom do you contact if you have questions or concerns about the project?
The researcher conducting this study is Kelly Caniglia. You may contact her at [redacted] You may also contact the faculty sponsor, Dr. Debra Maddox, at [redacted]

Whom do you contact if you have questions about your rights as a project participant?
If you have any questions or concerns regarding this project, you are encouraged to contact the Institutional Review Board, 1971 University Blvd., Green Hall Ste. 2845, Lynchburg, VA, 24515. The phone number is 434-592-5530 and the email address is irb@liberty.edu.
Disclaimer: The Institutional Review Board (IRB) ensures that human subjects research will be conducted ethically as defined and required by federal regulations. The topics covered, and viewpoints expressed or alluded to by student and faculty researchers are those of the researchers and do not necessarily reflect the official policies or positions of Liberty University.

By signing this document, you agree to participate in the quality improvement project. You will be given a copy for your records, and the project leader will keep a copy of the consent form with the study records.

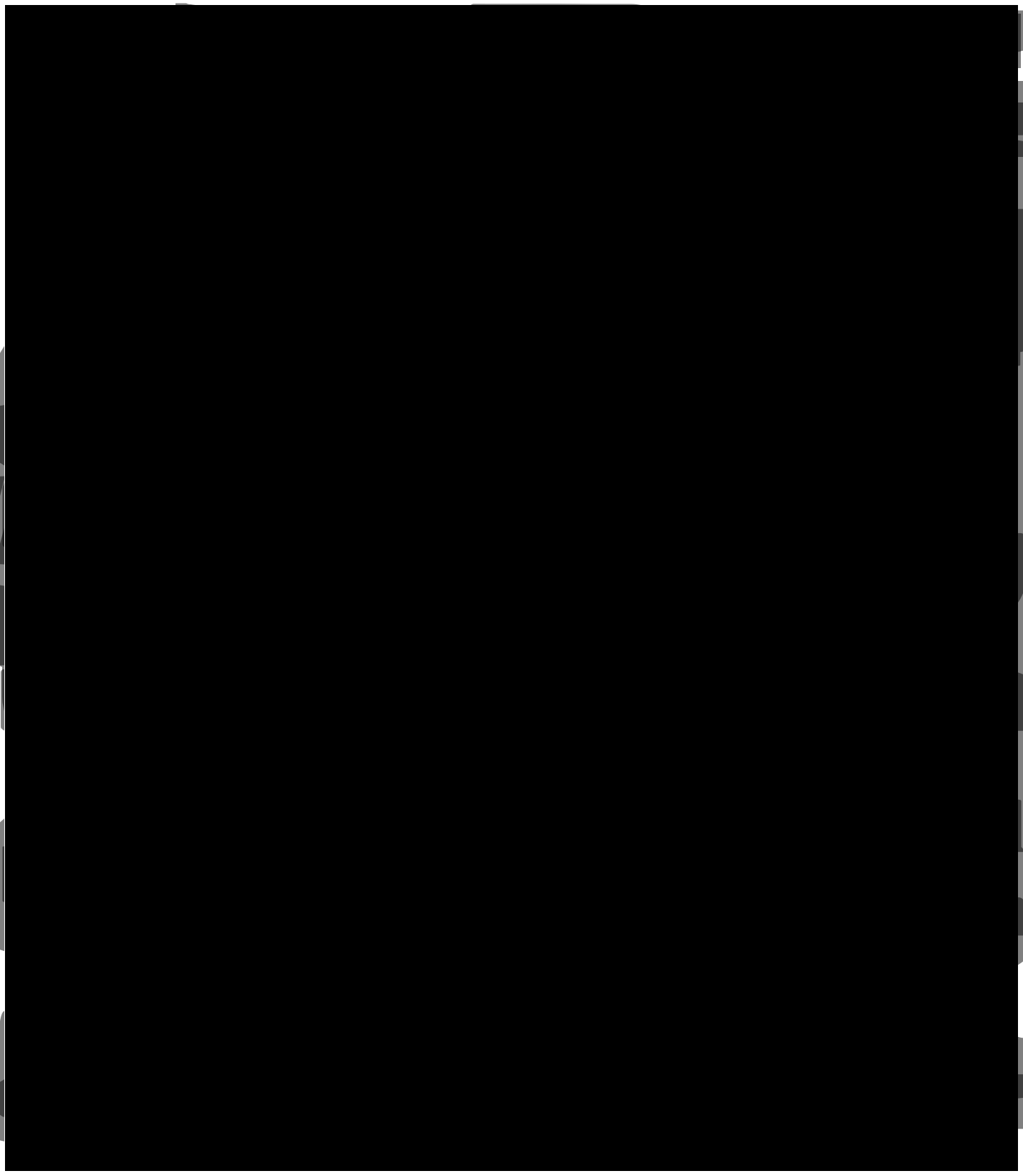
I have read and understood the above information, asked questions, and received answers. I consent to participate in this doctoral scholarly project.

_____
Printed Name of Study Participant

_____
Signature & Date

Appendix I

"Removed to comply with copyright"



Appendix J

"Removed to comply with copyright"

Appendix K

Questionnaires

Study Participant Demographic Information

Please do **NOT** disclose personal information (i.e., name and date of birth). Please fill in your responses and email this form back to me at [redacted]
The information collected from your medical records includes your most recent blood pressure readings and cholesterol levels. It is being collected to evaluate your 10-year risk of a serious cardiovascular event (e.g., stroke, heart attack, peripheral artery disease). The results will be emailed to you during the first educational sessions.

Age: _____
Race: _____
Ethnicity: _____
Gender: _____

1. Do you have a history of diabetes? Yes or No
2. Do you have a history of high blood pressure? Yes or No
    a. If yes, are you currently taking any blood pressure medication?
3. Are you a current smoker? Yes or No
4. Are you currently taking a statin (cholesterol medication) to lower your cholesterol levels?
    a. Yes or No
    b. Do you have any concerns about cholesterol-lowering medications?
5. Are you currently taking aspirin? Yes or No
6. Do you have a family history of high cholesterol? Yes or No
7. How knowledgeable do you think you are about cholesterol?
    a. 1. High 2. Moderate 3. Minimal 4. No knowledge
8. On average, how many hours of physical activity do you get a week?
9. What does a “heart-healthy diet” mean to you?
10. Your cholesterol level is a result of your diet and physical activity level.
    True or False?
11. How knowledgeable do you think you are about cholesterol?
    i. 1. High 2. Moderate 3. Minimal 4. No knowledge

12. On average, how many hours of physical activity do you get a week?

13. What does a “heart-healthy diet” mean to you?

14. If applicable, have you decided to take cholesterol medications as ordered?

15. Do you feel motivated and capable of making lifestyle changes, such as diet and physical activity?

16. What changes, if any, have you made?

Pre-Test (https://www.surveymonkey.com/r/DSYYWR3)

1. Total cholesterol levels should be?
    a. Less than 100 mg/dL
    b. Less than 150 mg/dL
    c. Less than 200 mg/dL
    d. Less than 250 mg/dL
2. Which type of cholesterol is associated with an increased risk of heart disease?
    a. HDL cholesterol
    b. Trans fat cholesterol
    c. Saturated fat cholesterol
    d. LDL cholesterol
3. What is a common cause of high cholesterol levels?
    a. Lack of physical activity
    b. Consuming foods high in saturated and trans fats
    c. Genetics
    d. Age
4. What health risks are associated with high cholesterol?
    a. Formation of blood clots, increasing the risk of heart disease and stroke
    b. Increased risk of diabetes, increasing the risk of sudden death
    c. Decreased risk of heart disease, reducing the risk of complications
    d. Formation of plaque in the arteries, increasing the risk of heart disease and stroke
5. What is the main function of cholesterol in our body?

a. Regulation of blood sugar levels and insulin production
b. Production of hormones, vitamin D, and bile acids
c. Formation of red blood cells and oxygen transportation
d. Maintenance of bone health and calcium absorption

6. What is most effective in lowering your cholesterol levels?
    a. Diet changes
    b. Increased physical activity
    c. Medications
    d. All of the above
7. Where does the cholesterol in your bloodstream come from?
    a. The foods you eat
    b. It is made in the liver
    c. It is controlled by genetics
    d. All of the above
8. Triglyceride levels should be?
    a. Less than 100 mg/dL
    b. Less than 150 mg/dL
    c. Less than 200 mg/dL
    d. Less than 250 mg/DL
9. Taking cholesterol-lowering medications means you don't have to make changes in your life.
    a. True
    b. False
10. Do you think high cholesterol is a serious health condition?
    a. Yes
    b. No

Post-Test (https://www.surveymonkey.com/r/DSNVM8W)

1. Total cholesterol levels should be?
    a. Less than 100 mg/dL
    b. Less than 150 mg/dL
    c. Less than 200 mg/dL
    d. Less than 250 mg/dL
2. Which type of cholesterol is associated with an increased risk of heart disease?
    a. HDL cholesterol
    b. Trans fat cholesterol
    c. Saturated fat cholesterol
    d. LDL cholesterol
3. What is a common cause of high cholesterol levels?
    e. Lack of physical activity
    f. Consuming foods high in saturated and trans fats
    g. Genetics
    h. Age
4. What health risks are associated with high cholesterol?
    a. Formation of blood clots, increasing the risk of heart disease and stroke
    b. Increased risk of diabetes, increasing the risk of sudden death
    c. Decreased risk of heart disease, reducing the risk of complications
    d. Formation of plaque in the arteries, increasing the risk of heart disease and stroke
5. What is the main function of cholesterol in our body?
    a. Regulation of blood sugar levels and insulin production
    b. Production of hormones, vitamin D, and bile acids
    c. Formation of red blood cells and oxygen transportation
    d. Maintenance of bone health and calcium absorption
6. What is most effective in lowering your cholesterol levels?
    a. Diet changes
    b. Increased physical activity

c. Medications

d. All of the above

7. Where does the cholesterol in your bloodstream come from?

   a. The foods you eat

   b. It is made in the liver

   c. It is controlled by genetics

   d. All of the above

8. Triglyceride levels should be?

   a. Less than 100 mg/dL

   b. Less than 150 mg/dL

   c. Less than 200 mg/dL

   d. Less than 250 mg/DL

9. Taking cholesterol-lowering medications means you don't have to make changes in your life.

   a. True

   b. False

10. Do you think high cholesterol is a serious health condition?

    a. Yes

    b. No

11. How knowledgeable do you think you are about cholesterol?

    a. 1. High 2. Moderate 3. Minimal 4. No knowledge

    b. Has your knowledge of cholesterol increased as a result of the educational sessions?

12. On average, how many hours of physical activity do you get in a typical week?

13. What does a “heart-healthy diet” mean to you?

14. If applicable, have you decided to take cholesterol medications?

15. Do you feel motivated and capable of making lifestyle changes, such as diet and physical activity? What changes, if any, have you made?

Appendix L

Cholesterol Education Outline